DECEMBER 2020

Access Ohio 2045

OHIO'S TRANSPORTATION PLAN

OHIO DEPARTMENT OF TRANSPORTATION

Mike DeWine, Governor
Jack Marchbanks, Ph.D., ODOT Director

The Access Ohio 2045 Plan was a collaborative effort among many partners. The Ohio Department of Transportation would like to thank the Access Ohio Steering Committee member agencies, those who hosted stakeholder and public meetings and the consultant team.

Steering Committee Member Organizations

Akron-Canton Airport
American Council of Engineering Companies
Benchmark River and Rail Terminals, LLC
Brooke Hancock Jefferson Metropolitan Planning Commission
Buckeye Hills Regional Council
Clark County-Springfield Transportation Coordinating Committee
Federal Highway Administration
Greater Ohio Policy Center
Maumee Valley Planning Organization
McDaniels Construction
Miami Valley Regional Planning Commission
Mid-Ohio Regional Planning Commission
Northeast Ohio Areawide Coordinating Agency
Ohio Association of Regional Councils
Ohio Aviation Association
Ohio Chamber of Commerce
Ohio Contractor's Association
Ohio County Engineers Association
Ohio Mid-Eastern Governments Association
Ohio Municipal League
Ohio Public Transit Association
Ohio Public Works Commission
Ohio Rail Development Commission
Ohio Railroad Association
Ohio Township Association
Ohio Trucking Association
Ohio Turnpike and Infrastructure Commission
Ohio Kentucky Indiana Regional Council of Governments
Policy Matters Ohio
Sierra Club of Ohio
Toledo-Lucas County Port Authority
Transportation Research Center

Public Meeting Hosts and Locations

Buckeye Hills Regional Council, Marietta
Lima-Allen County Regional Planning Commission, Lima
Miami Valley Regional Planning Commission, Dayton
Mid-Ohio Regional Planning Commission, Columbus
Northeast Ohio Areawide Coordinating Agency, Cleveland
Ohio Department of Transportation District 4, Akron
Ohio-Kentucky-Indiana Regional Council of Governments, Cincinnati
South Point Chamber of Commerce, South Point
Toledo Metropolitan Area Council of Governments, Toledo
Zane State College, Cambridge

Consultants

Cambridge Systematics, Inc.
Engage Public Affairs, LLC
High Street Consulting
Lawhon & Associates
MurphyEpson, Inc.

Message from Ohio Governor DeWine

Dear Fellow Ohioans:

The Ohio Department of Transportation (ODOT) has partnered with local governments, associations and private businesses across the state to produce Access Ohio 2045 (AO45). AO45 details the state's vision for Ohio's transportation system and identifies strategies and initiatives to guide, inform and support long-term transportation investments for the next 25 years.

ODOT's mission is to provide safe and easy movement of people and goods throughout the state. This report examines how ODOT can continue fulfilling its mission, while preparing for future changes within the transportation landscape.

I want to express my sincere appreciation to all members who contributed to this report. Each partner shared a critical perspective. Together, we will continue to advance Ohio's transportation systems, ensuring reliable access and safety for all travelers.

Very respectfully yours,

Mike DeWine
Governor

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Introduction

Ohio's transportation system is one of the state's greatest assets and plays an enormous role in how people and goods move throughout the state. Whether traveling to work, school, health care, retail stores or any number of destinations across Ohio, the transportation system is essential to all Ohioans.

Access Ohio 2045 (AO45) is the latest state long-range transportation plan – it forms the basis of Ohio's multimodal transportation investment and policy decisions over the next 25 years. The plan was developed under the guidance of the Ohio Department of Transportation (ODOT) in partnership with public and private stakeholders and engagement with residents across Ohio. The needs and desires for Ohio's transportation system are reflected in AO45's vision statement.

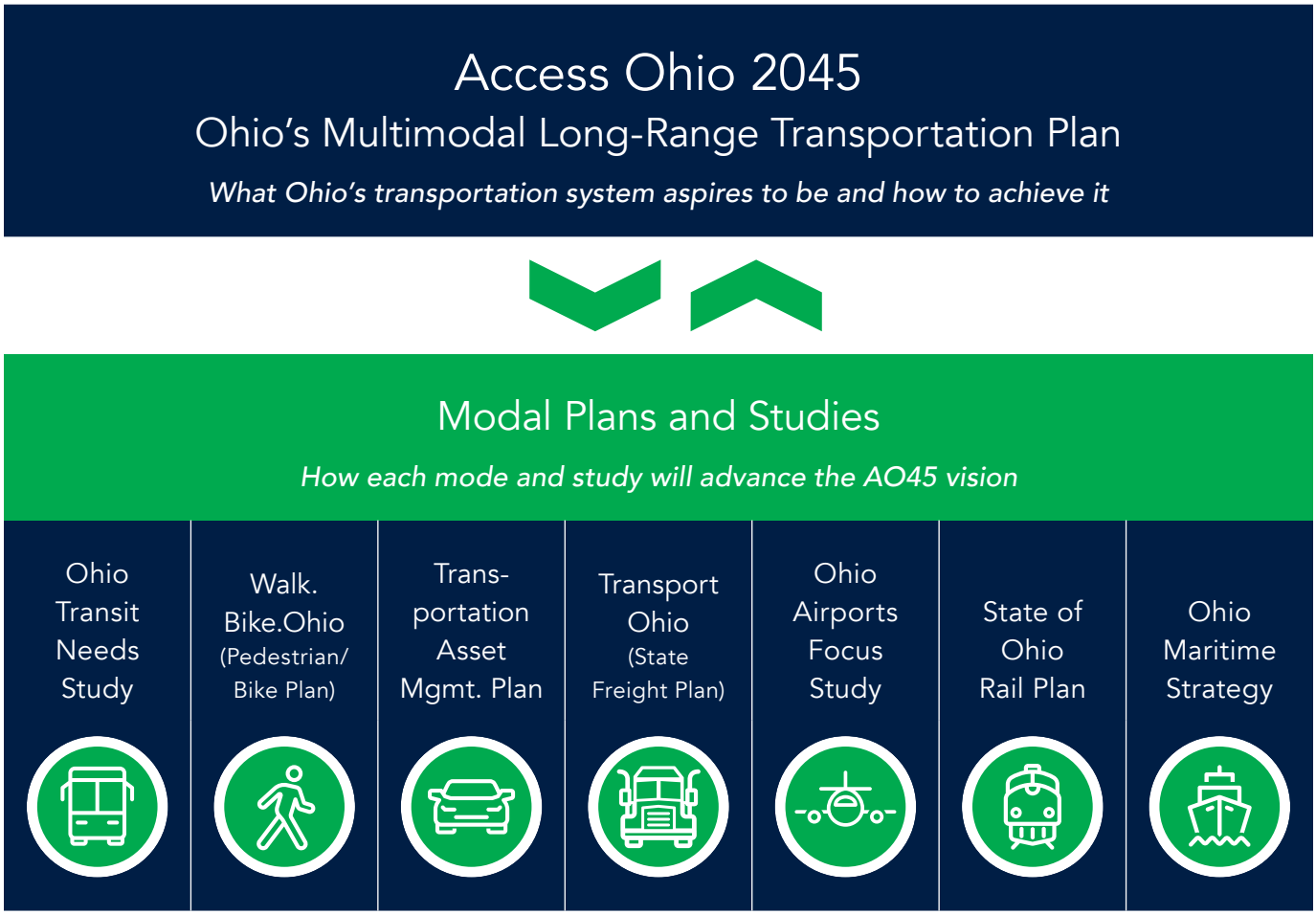
All Ohio will be ***connected*** by a ***safe***, ***smart*** and ***collaborative*** transportation system that moves people and freight efficiently and reliably and supports ***community*** visions.

Plan goals and strategies were developed to support the five themes emphasized in this vision. Collaboration and partnerships will ensure Ohio's transportation system functions as an integrated system across all modes and jurisdictions. Working together is critical to ensuring the transportation system is safe, efficient and reliable as it faces growing demand for moving people and freight.

Access Ohio 2045: A Plan of Plans

AO45 should be thought of as a "Plan of Plans" that will align and guide the development of individual modal plans and studies. AO45 provides the framework to prepare Ohio for future uncertainties with regard to demographics, development patterns, economics and technology.

FIGURE 1 – PLAN OF PLANS



As Figure 1 illustrates AO45 will serve as a reference point to direct individual modal plans and studies which simultaneously follow their own planning requirements and engagement processes.

To further ensure AO45's vision, themes, goals and strategies are carried forward in Ohio's transportation planning efforts, ODOT will convene an ongoing Advisory Committee to coordinate implementation. Similar to the AO45 Steering Committee, the committee will include partners from throughout Ohio to guide implementation of AO45 policies, share lessons learned and adjust strategies and initiatives as needed.

Together, ODOT and its transportation partners will expand transportation data sharing, address security risks to transportation assets, coordinate planning at both system and corridor levels, support more multimodal options, leverage emerging technologies and advance sustainable transportation funding options.

Ohio's Multimodal Vision

AO45 was developed five years after the last Ohio long-range transportation plan – Access Ohio 2040 (AO40).

AO45 Differs from Prior Ohio Long-Range Transportation Plans

- AO45 is a ***plan for all of Ohio***, providing a vision for all partners involved in planning and managing Ohio's transportation system. ODOT is the lead agency for developing and implementing AO45, but the plan extends beyond ODOT's areas of responsibility to address all transportation statewide.

- AO45 envisions and plans for a ***comprehensive, multimodal transportation system*** in Ohio. The plan focuses on improving mobility for people and freight on a connected system comprising multiple modes, including emerging technologies and systems that are just now being developed or may yet be developed in the future.

- AO45 is intended to be a ***single reference point*** for other statewide transportation plans related to safety, asset management, freight and systems management and operations, as well as specific modes of transportation. It also is intended to provide a policy framework to support updates of regional and local transportation plans across Ohio.

- AO45 was developed using a ***scenario planning approach*** that considered a range of plausible futures for Ohio's population, economy, development and technology and the potential impacts of these futures on Ohio's transportation system. By considering these alternative futures, a robust and resilient plan was developed that adapts to future changes and disruptions.

- AO45 is the first long-range transportation plan in Ohio developed under ***federal guidelines*** related to the Moving Ahead for Progress in the 21st Century Act (MAP-21) in 2012 and the Fixing America's Surface Transportation (FAST) Act in 2015. These guidelines include consideration of targets for making progress toward national performance goals, as well as emerging issues such as travel and tourism, and reliability and resiliency.

- Finally, AO45 was designed with ***implementation*** in mind. It identifies potential initiatives to carry forward key strategies, as well as indicators for tracking progress toward AO45's goals.

An Inclusive Approach

AO45 was Shaped by Many Voices

- A ***Technical Advisory Committee*** representing key ODOT offices and the Federal Highway Administration (FHWA) met regularly throughout the plan update process to provide technical guidance on key issues, opportunities and strategies.

- A 50+ member ***Steering Committee*** provided overall guidance and met seven times during the development process. The Steering Committee represented ODOT, other state agencies, FHWA, all transportation modes, metropolitan planning organizations (MPOs), regional transportation planning organizations (RTPOs), county and municipal governments, business and economic development organizations, community and environmental interests and other partners statewide.

- An extensive ***public involvement*** process engaged residents across the state through two rounds of public meetings involving about 600 Ohioans; three statewide surveys with nearly 3,000 responses; briefings at a wide range of partner meetings, workshops and conferences; and a project website with 4,175 visitors.

Goals and Objectives

AO45 focuses on seven long-range goals for Ohio's transportation system. These goals build on the goals identified in AO40, which were reaffirmed and refined to guide Ohio for the next 25 years.

Goals Emerged from Many Sources of Input

- Steering Committee guidance
- Public meetings and surveys specific to the AO45 process
- A 2016 statewide customer survey, which included responses from 8,500 Ohioans on their transportation preferences and needs
- A review of federal guidance and best practices in other states

FIGURE 2 – AO45 GOALS

AO45 adds quality of life as a new goal, recognizing the importance of supporting vibrant communities across the state. The AO45 goals and objectives also give greater emphasis to environmental stewardship compared to prior plans and sharpen the state's focus on reliability and accessibility of travel for all transportation users.

FIGURE 3 – AO45 OBJECTIVES

Transportation System Performance

AO45 development considered recent trends of Ohio's transportation system performance. This included an emphasis on the performance measures identified by federal rule following MAP-21 for state departments of transportation and MPOs. The following tables summarize Ohio's progress toward meeting its established target for each required performance measure.

The first federal performance reporting period is 2018–2022, so these measures and targets represent the initial results of the first collective effort to capture the performance of the state transportation system. Over time, these measures may change to reflect innovations in operations, data analysis and technology. These measures and targets were decided upon through a joint effort with MPOs and transit providers.

Table 1 documents transit asset management coordinated by ODOT for small transit operators. These targets were set in 2019. ODOT is also working with small transit providers to establish public transportation safety performance targets, which must be set by the end of calendar year 2020. Large transit operators establish and report their performance individually. Table 2 documents highway system performance measures established for National Highway System (NHS) miles in Ohio. Targets for highway safety, assets and reliability were set in 2018.

Overall, ODOT and its partners are making significant progress toward attaining the established targets for each of the required performance measures. For more details, please refer to the Access Ohio 2045: System Performance Report. The targets, and Ohio's progress toward them, were considered in identifying AO45 goals, objectives and strategies, particularly the continued emphasis on improving highway safety and enhancing mobility.

ODOT collects or buys and enters data on all of these performance measures. Better data makes better decisions. See ODOT's Asset Management Playbook for more information.

TABLE 1 – TRANSIT ASSET MANAGEMENT

Performance Measure	How We Measure It	2019 Target	2019 Performance	Target Met	Trend
Transit Asset Management					
Rolling Stock	Percent of revenue vehicles that have met or exceeded their useful life benchmark	Range of 2–30% based on vehicle	Range of 5–40% based on vehicle	○	Range of 2–30% based on vehicle
Equipment	Percent of service vehicles that have met or exceeded their useful service life benchmark	Range of 0–30% based on vehicle	Range of 30–75% based on vehicle	○	Range of 0–30% based on vehicle
Facilities	Percent of facilities rated below a 3 on the condition scale	30%	11%	✓	30%

Key ✓ This indicates a performance target was met.

Source: National Transit Database, ODOT

Table 1 – Transportation System Performance Notes

- These asset performance targets were set in 2019 for Ohio's small transit operators through a group planning process. The vehicles and facility assets reported here are owned by those agencies. Useful life benchmarks values are provided by the Federal Transit Administration.
- ODOT is working with small transit operators to set transit safety performance targets before the end of 2020. Reporting standards are still under development and therefore not reported here.

Performance measures for Ohio's roadways are built from years of data collection and reporting which precede new federal target setting requirements. Performance measures for other modes beyond transit assets and safety are still emerging across the country and vary by state. Some state departments of transportation – working closely with local partners responsible for transit, active transportation and other non-highway modes – are beginning to adopt multimodal accessibility and mobility measures. They reflect how these modes contribute to overall transportation system performance. One example is to measure travel time reliability to critical destinations and services such as job, health care and education facilities.

Most freight travels by roadway, but rail, aviation and maritime also facilitate the movement of goods. Intermodal connections between these modes are crucial to delivering goods on time. However, acquiring data on the condition of multimodal freight infrastructure is more complicated due to the large share of freight assets owned by private companies.

In the future, as data standards and data collection efforts evolve, ODOT looks to collaborate more with local partners to report quantitative and qualitative performance measures for walking, biking, transit and freight.

TABLE 2 – HIGHWAY SYSTEM PERFORMANCE

Performance Measure	How We Measure It	2018 Statistics	Target	Target Met	Trend
Highway Safety					
Fatalities	Number of fatalities	1,068	1,055 fatalities	○	^
Fatality rate	Number of fatalities per 100 million Vehicle Miles Traveled	0.93	0.91 fatality rate	○	^
Serious injuries	Number of serious injuries	7,627	8,348 serious injuries	✓	v
Serious injury rate	Number of serious injuries per 100 million Vehicle Miles Traveled	6.66	7.21 serious injury rate	✓	v
Non-motorized fatalities and serious injuries	Number of non-motorized fatalities and serious injuries	829	824 fatalities and serious injuries	○	^
Pavement and Bridges					
Pavement condition	Percent of pavement in good condition	60% interstate	At least: 50% on interstate	✓	^
		45% non-interstate NHS	35% on non-interstate NHS	✓	^
	Percent of pavement in poor condition	0.1% interstate	No more than: 1% on interstate	✓	›
		1.2% non-interstate NHS	3% on non-interstate NHS	✓	›
Bridge condition	Percent of deck area in good condition	58.8%	At least: 50% of NHS bridges	✓	^
	Percent of deck area in poor condition	1.8%	No more than: 5% of NHS bridges	✓	v

Performance Measure	How We Measure It	2018 Statistics	Target	Target Met	Trend
System Performance/Reliability					
Travel time reliability	Percent of the person-miles traveled that are reliable	89% interstate	At least: 85% on interstate	✓	⌃
		90% non-interstate NHS	80% non-interstate NHS	✓	⌃
Truck travel time reliability	Truck travel time reliability index	1.37 TTTR	1.5 Level of travel time reliability	✓	›
Emissions reduction	Total emissions reduction from Congestion Mitigation and Air Quality projects	109 kg/day	$PM_{2.5}$ – 36 Kg/day	✓	⌃
		332 kg/day	NO_x – 537 kg/day	○	⌃
		68 kg/day	VOC – 69 kg/day	○	⌃
Excessive delay	Annual hours of peak hour excessive delay per capita	11.4 h	Cincinnati – 12 hours	✓	⌃
		8.2 h	Cleveland – 10 hours	✓	⌃
		12.6 h	Columbus – 12 hours	○	⌃
Non-single occupancy vehicle travel	Percent of non-single-occupancy vehicle travel in urbanized areas	17.7%	Cincinnati – 17.4%	✓	⌃
		18%	Cleveland – 18.5%	○	⌃
		18%	Columbus – 19%	○	⌃

Key

- › Data collected from recent years shows a flat trend line.
- ⌄ or ⌃ The data suggests this performance measure is moving in a positive direction, closer to the target.
- ⌃ Data from the last few years is not moving in a fixed direction.
- ✓ This indicates a performance target was met.

Table 2 – Transportation System Performance Notes

- The 2018 Statistics column represents 2018 data.
- Highway safety measures have 2020 as a target year. The remaining measures have 2022 as their target year. Targets were established using baseline data from five-year rolling averages (2014–2018).
- Targets are for the first federally-required performance period (2018–2022) and are subject to periodic adjustment.

Ohio's Transportation Future

AO45 attempts to understand the forces that will change transportation in Ohio through the year 2045 and then define a set of strategies to prepare for these changes. ODOT and its partners examined a range of possible futures informed by population, economic, development and technology trends that impact transportation. These futures were developed through local and national research and refined through stakeholder, public and subject matter expert input. Each future represents a combination of conditions that *could* occur in Ohio, leading to possible shifts in transportation services, choices and travel.

Trends and assumptions behind each future were fundamental to estimating multimodal transportation needs. Potential impacts within and across the futures informed the development of broad, comprehensive strategies to respond to a variety of possible changes affecting Ohio's transportation system. Planning for multiple futures provided a foundation to understand a mix of unique challenges and opportunities ODOT and its partners may face by 2045.

The alternative futures were developed prior to the COVID-19 pandemic's onset in early 2020. However, they did assume Ohio and other states would face potential risks and disruptions during the next 25 years, including the potential for multiple economic cycles during that period.

The Only Constant is Change

AO45 invited Steering Committee members, transportation partners and the public to weigh in on these drivers of the four transportation futures.

Population

Will population go up or down? Will there be more younger or older adults, or people with disabilities?

Economy

Will Ohio's economy include the same mix of industry as today, or will there be job growth in new areas?

Development

Will development patterns be more concentrated in cities and suburbs? How might rural areas grow?

Technology

Will technology advance at a steady pace, or will it accelerate and become even more widely adopted? How disruptive will it be?

Four Futures Describe Ohio's 2045 Transportation Conditions

Current Trends

A future where Ohio experiences modest growth and incremental change as it has in the past. Most Ohio residents, visitors and businesses still rely on vehicles and roads to travel and ship products; however, there is more need for on-demand and short distance transportation.

Innovation

A future where technology changes are widespread, resulting in more transportation options for Ohio residents, visitors and businesses. High-speed communication and a more connected network allow people and goods to move efficiently and seamlessly and at different times of the day.

Global Markets

A future where stronger global commerce results in more goods moving by truck, rail, water and air via Ohio, other states or nations. A wide range of diverse, specialized products and services are available to more Ohioans.

Ohio Renaissance

A future where Ohio's population and economic growth are higher than previous trends, reflecting increasing attractiveness of Ohio as a place to live, work and do business. Ohio's assets and technology changes strengthen and support more demand for transportation options and services to more destinations.

Current Trends

The future looks a lot like our experience from the past few years.

Population

Ohio's population continues to grow slowly while becoming older and more diverse; more people with disabilities, living in poverty and with specific mobility needs

Economy

Ohio's economy remains diverse, with long-term growth in services, distribution and energy

Development

Population growth continues to be concentrated in outer suburbs of existing major metropolitan areas, with some urban infill

Technology

Ohioans use existing and new technologies; adoption varies across demographic groups and industries

Potential Transportation Impacts

- Population growth increases vehicle miles traveled, resulting in more congestion
- Demand also increases for active transportation, transit, aviation; transit ridership remains focused on transit-dependent populations such as lower income residents, residents with disabilities and essential workers
- Economic growth increases demand for moving freight using trucking, air cargo, freight rail and water
- Condition of pavement, bridges, transit fleets and airport and maritime infrastructure declines due to age, use and exposure

Innovation

The future is driven by technology and innovation.

Population

Millennial and GenZ talent moves to or stays in Ohio; increased longevity and mobility for older adults and residents with disabilities

Economy

Job growth shifts toward advanced manufacturing, technology and logistics; some disruption from automation and workforce shortages

Development

More dispersed and specialized economic activity; more urban infill and mixed-use development

Technology

Technology use accelerates quickly and is widely adopted, including automated and connected vehicles, alternative fuels, drones, Internet of Things, 3D printing, telepresence, big data

Potential Transportation Impacts

- Automated and connected vehicles enable more efficiency from existing roads
- More integrated, connected and coordinated transit and shared use mobility provide better options and attract more riders
- Options for intercity travel expand, including improved intercity bus, rail and air services as well as new technologies like hyperloop
- New technologies allow more efficient freight movements (truck, rail, intermodal and maritime)
- Advances in communication technology require rapid infrastructure changes across modes

Global Markets

The future is driven by global trade in goods and services.

Population

Ohio's population becomes more diverse, with more workers and migration into Ohio, especially in urban areas

Economy

Increasing global ties and volatility; growth in Ohio manufacturing, agriculture, energy, logistics and related services

Development

Concentration of distribution activity around ports and industrial centers; dispersion of specialized production, including rural business opportunities

Technology

New logistics and freight technologies; both smaller (on-demand delivery, drones) and larger (truck platooning, larger trains, ships and hyperloop)

Potential Transportation Impacts

- Increased truck traffic on major Interstates and highways creates more congestion
- Increased truck tonnage accelerates bridge and pavement deterioration in and around industrial areas
- On-demand deliveries increase localized congestion and conflicts with other modes
- Greater use of delivery drone and new cargo aircraft requires new airport infrastructure and secondary launch sites
- Agriculture, energy and manufacturing commodity flows increase through ports, burdening maritime and rail infrastructure

Ohio Renaissance

The future is driven by increased population growth, innovation and global competitiveness.

Population

Increasing retention of younger residents and return of former residents; appeal of lower cost of living, available water and stable climate

Economy

Resurgence in manufacturing and agriculture and continued growth in logistics, technology, energy, tourism, health care and other services

Development

Growth focused in centers connected by corridors; importance of unique community and environmental assets

Technology

Technology use accelerates and supports Ohio's economy and communities

Potential Transportation Impacts

- Increased demand for all modes due to higher population and economic growth
- Increased demand for transit, active transportation and shared mobility in city centers
- Increased demand for intercity travel including air, transit, rail and potentially new technologies such as hyperloop
- Increased traffic volumes require more road and bridge preservation on interstates, in metropolitan areas and around logistics hubs
- Expanded air cargo, freight rail and maritime activity related to energy, manufacturing and consumer goods

Transportation Needs Assessment

AO45 forged a new approach to understand the extent of Ohio's future transportation needs. Needs encompass both ODOT and partner systems. As opposed to a single forecast, needs vary across unique conditions assumed in each alternative future and by transportation category. This approach provides a comprehensive picture of Ohio's statewide multimodal transportation needs.

Since Ohio's multimodal transportation assets are owned and operated by a wide variety of public and private entities, generating reliable numbers is a challenging task. For example, roadway assets are publicly owned and operated by ODOT, counties, municipalities and townships; transit, air, rail and maritime assets are owned and operated by a mix of public and private partners.

These planning-level estimates give a high-level view of potential transportation needs through 2045 based on the best available information. They are order-of-magnitude estimates appropriate for advancing decisions for a policy-based statewide plan and helping to identify what factors contribute to changes in transportation needs.

TABLE 3 – SUMMARY OF ANTICIPATED NEEDS

System	Anticipated Needs 2018–2045[1]
ODOT	**$71–$78 Billion[2]** $2.6–$2.8 Billion Annually
Partners *(counties, municipalities, townships, other state agencies and other public and private operators)*	**$103–$116 Billion** $3.7–$4.1 Billion Annually
Total	**$174–$194 Billion** $6.2–$6.9 Billion Annually

[1] All needs estimates are presented using 2018 U.S. dollars

[2] ODOT totals do not include operating costs such as payroll, equipment and facilities

To address AO45 goals, total statewide transportation needs will range between $174 billion and $194 billion through 2045, or approximately $6.2 billion to $6.9 billion annually. These estimates were informed by more than 60 sources – including prior studies, data sets/systems and ODOT subject matter expert interviews. They include support for all statewide transportation assets and resources required to meet and sustain AO45's vision and goals, and stated performance measures.

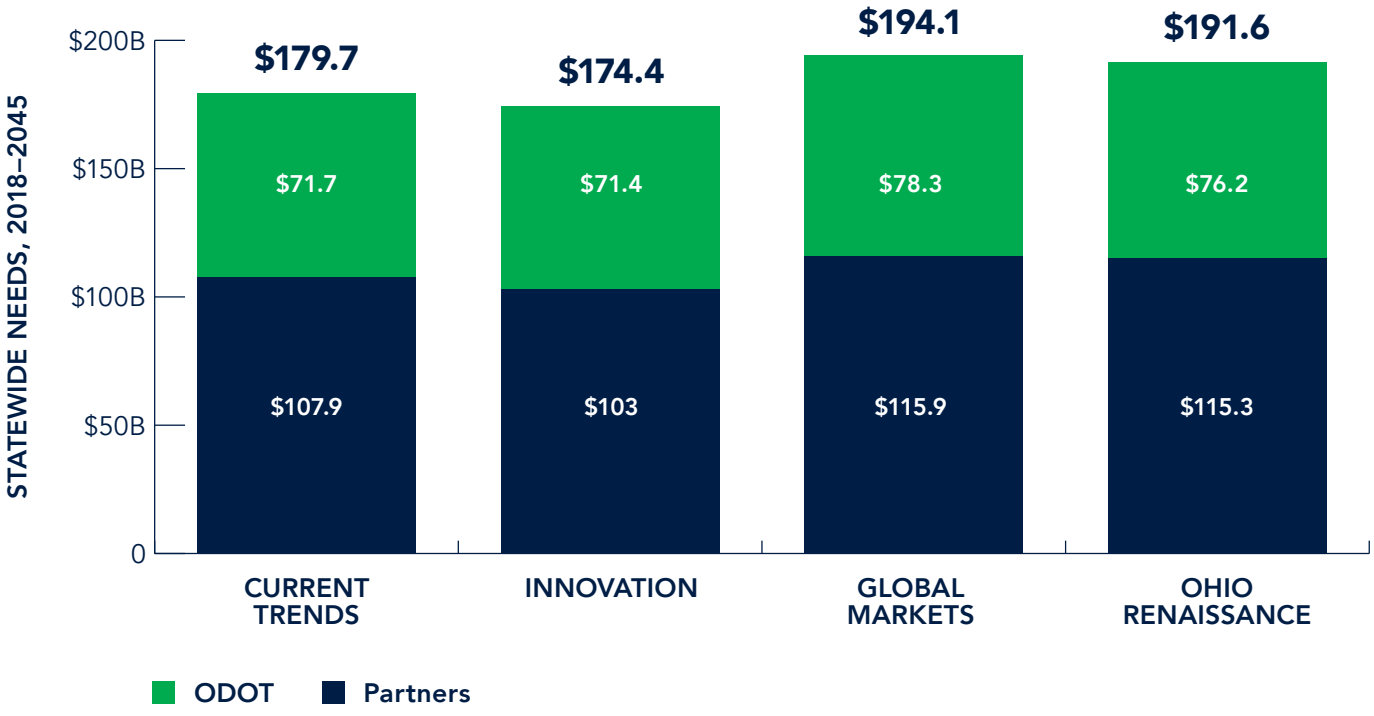
Needs Vary Based on What the Future Looks Like

Statewide needs estimates are highest in the Global Markets future. Additional travel of goods and people across the state puts more pressure on roads and bridges. New roads and multimodal connections are needed to accommodate economic growth.

Statewide needs are lowest in the Innovation future as advances in technology and new mobility options make the transportation system more efficient. Advances in vehicle technologies support safer, more reliable travel. Greater availability of mobility as a service (MaaS) means more options to move from point to point without owning a vehicle. However, the implementation of new technology also can increase costs for ODOT and partners, notably in the categories of operations and transit.

The Ohio Renaissance future estimates fall between Innovation and Global Markets, where some of the same technology benefits from Innovation drive needs down, but economic and population growth still lead to more pressure on existing infrastructure and demand for new multimodal connections.

FIGURE 4 – STATEWIDE NEEDS BY ALTERNATIVE FUTURE



Needs Vary Across Different Categories

Needs Across Several Categories Were Analyzed

- **Active transportation** needs include infrastructure to support pedestrian and bicycle facilities such as adding bike lanes, trails and sidewalks. It represents approximately 2% of the total.

- **Aviation** needs include fixing airport pavement, taxiway construction, terminal modifications and other airfield related development projects. It is about 5% of the total needs.

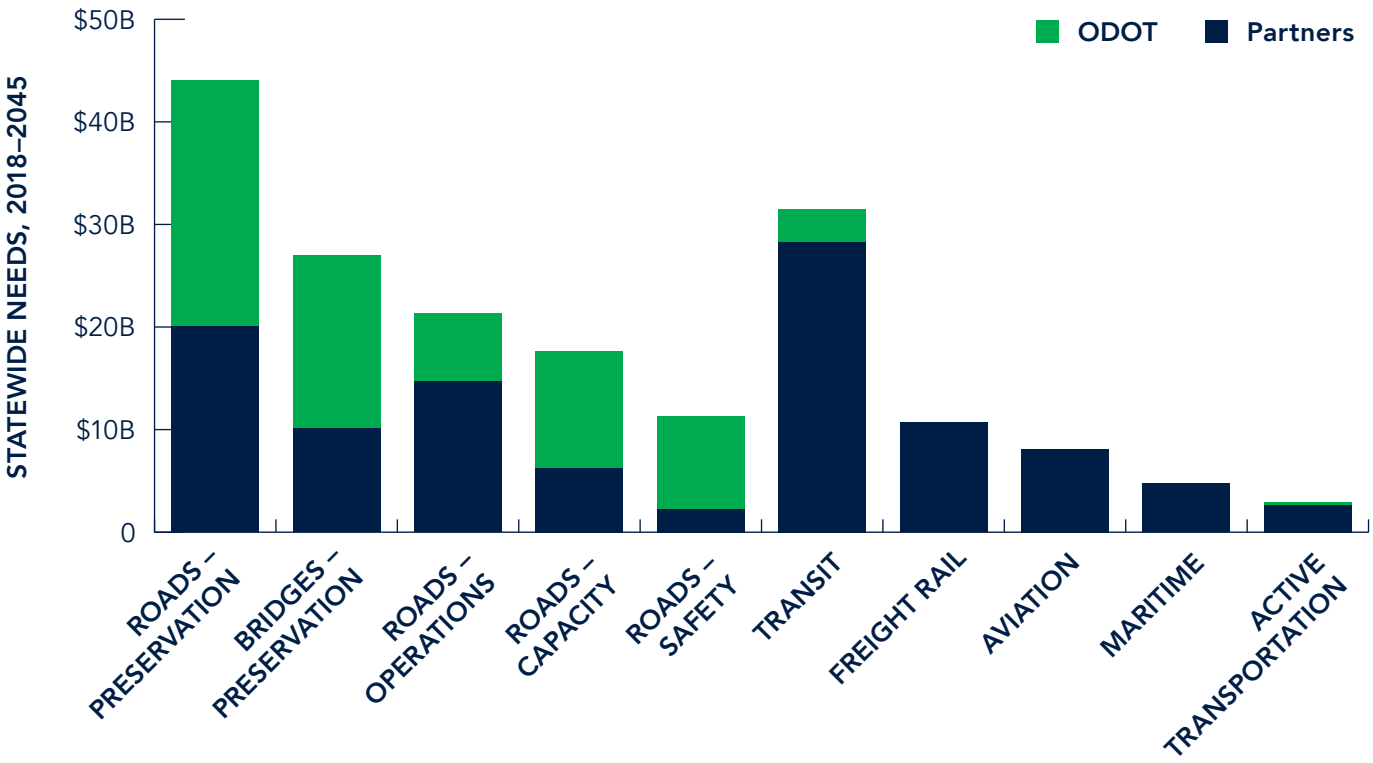
- **Freight rail** needs include track (including intermodal terminals), right-of-way, yards, facilities, crossings, bridges and signals. The bulk of these needs are borne by the private sector. They are about 6% of the total.

- **Roadways** needs remain the largest share of all categories, about 68% of the total.
  - **Preservation of state highways and local roads** includes maintenance of state and local roads, bridges and the assets that accompany them such as sidewalks, striping, lighting and guardrails. It adds up to 40% of the total across all modes.
  - **Operations** includes the core functions to keep roadways moving safely and reliably. Examples include traffic management, operations and maintenance of intelligent transportation systems (ITS) infrastructure and traffic signals, and snow and ice removal. A large portion of these fall on local roadway operators.
  - **Capacity** includes necessary additions to roadways to address congestion and improve reliability, such as added lanes, interchange improvements and new facilities.
  - **Safety** needs include engineering improvements at high and severe crash locations as well as enforcement of safety laws and driver education.

- **Maritime** includes improvement projects for ports and waterways, such as seepage barrier, lock, and dam construction; dredging; and repairs to locks, dams and service bridges. The mode represents about 3% of the total.

- **Transit** represents nearly 20% of the total across all modes. This category includes all public transit services across the state – bus, light rail and on-demand or scheduled services. The numbers cover operations (keeping services running day to day) and capital (vehicles, garages and buildings).

FIGURE 5 – STATEWIDE NEEDS BY CATEGORY – CURRENT TRENDS



Meeting Our Needs Matters for Ohioans

Meeting our transportation needs is a challenge shared by the many Ohio agencies and partners that help move people and goods safely and efficiently across the state. Ensuring people have access to more than one mode will become more critical in the coming decades.

Strategies

Advancing the AO45 vision and goals requires strategic action by ODOT and its partners. A particular emphasis of this Plan is identifying implementable strategies that advance Ohio's vision across the full range of the potential futures that the state is facing.

A large pool of potential strategies was drawn from stakeholder input, consideration of best practices in transportation and identification of Ohio's future opportunities. Each strategy was carefully considered in the context of the four Alternative Futures discussed previously. Strategies that set Ohio up for success even while facing an uncertain future were emphasized. Each possible strategy was vetted to ensure it directly supports Ohio's vision and goals.

The following pages lay out 13 major AO45 strategies for strengthening Ohio's transportation system over the next 25 years. The strategies are organized into five major themes, reflecting key elements of Ohio's transportation vision. In addition to framing specific actions ODOT and partners can take across these important areas, the strategies reflect an emphasis on resiliency, equity and sustainability.

At a Glance: Themes and Strategies

» SAFE

Strategy 1: **Ohio will champion initiatives leading to zero transportation deaths and injuries.**

Strategy 2: **Ohio will proactively address transportation safety, security and environmental risks.**

» SMART

Strategy 3: **Ohio will leverage technology and data to improve transportation safety, efficiency and reliability.**

Strategy 4: **Ohio will evolve its transportation system for a connected and autonomous future.**

» CONNECTED

Strategy 5: **Ohio will enhance critical elements of its transportation system to optimize safe, efficient and reliable movement of people and goods.**

Strategy 6: **Ohio will develop transportation plans for major statewide and regional transportation corridors.**

» COMMUNITY-ORIENTED

Strategy 7: **Ohio will advance transportation investments that expand the state's economy and workforce.**

Strategy 8: **Ohio will advance a transportation system that improves quality of life and moves communities forward for all residents.**

Strategy 9: **Ohio will increase access to transit and shared mobility services.**

Strategy 10: **Ohio will advance walking and bicycling as a safe, convenient and accessible transportation option for everyone.**

» COLLABORATIVE

Strategy 11: **Ohio will strengthen its transportation partnerships.**

Strategy 12: **Ohio will expand the transparent use and sharing of transportation data and information.**

Strategy 13: **Ohio will advance innovative and sustainable transportation funding options.**

TABLE 4 – THEMES, STRATEGIES, INITIATIVES AND GOALS

Theme		» SAFE		» SMART		» CONNECTED	
Strategy #		1	2	3	4	5	6
Initiatives		» Laws » Partners » Proven Counter-measures	» Risk » Security	» Asset Management » Operations	» Infra-structure » Alternative Fuels » Broadband	» Passenger Modes » Freight Modes	» Corridor Plans
Goals	Safety	✓	✓	✓	✓	✓	✓
	Preservation		✓	✓	✓		
	Efficiency & Reliability	✓	✓	✓	✓	✓	✓
	Mobility & Accessibility		✓	✓	✓	✓	✓
	Economic Competitiveness	✓	✓	✓	✓	✓	✓
	Quality of Life	✓	✓		✓		✓
	Environmental Stewardship		✓	✓	✓		✓

Theme		» COMMUNITY-ORIENTED				» COLLABORATIVE		
Strategy #		7	8	9	10	11	12	13
Initiatives		» Job Access » Economic Development	» Values, Health, Equity » Older Adults, People with Disabilities » Environment	» Local Transit » Coordinated Service » Mobility as a Service	» Planning & Policy » Education & Promotion » Collaboration	» Partnerships	» Data Sharing	» Highway Funding » Transit Funding » Public Private Partnerships
Goals	Safety		✓		✓	✓	✓	✓
	Preservation					✓	✓	✓
	Efficiency & Reliability	✓	✓	✓	✓	✓	✓	✓
	Mobility & Accessibility	✓	✓	✓	✓	✓	✓	✓
	Economic Competitiveness	✓	✓	✓	✓	✓	✓	✓
	Quality of Life	✓	✓	✓	✓	✓	✓	✓
	Environmental Stewardship		✓	✓	✓	✓	✓	✓

Table 4 – Themes, Strategies, Initiatives and Goals Notes

- Each check in Table 4 represents the potential for individual strategies and corresponding initiatives to advance AO45 goals.
- Initiatives under the Collaborative theme support strategies across AO45. Therefore, each initiative received a check to reflect a shared planning process.

» SAFE

A *safe* transportation system focuses on identifying, reducing and mitigating safety, security, extreme weather, public health and other risks. These strategies underscore the primary importance of the AO45 safety goal and the state's commitment to continue to reduce transportation fatalities and injuries across all modes. These strategies also recognize the impacts that a safe system has on all other goals. Reducing crashes and addressing other risks can improve the efficiency and reliability of the system, encourage use of all transportation modes and enhance quality of life for Ohioans. A significant commitment to safety is an emphasis across all the AO45 futures.

Strategy 1: **Ohio will champion initiatives leading to zero transportation deaths and injuries.**

- **Laws** – Strengthen transportation safety laws to address distracted driving, seat belt use, work zone speed limits and child passenger safety.
- **Partners** – Enhance collaboration among state and local safety, education, health, enforcement, engineering and emergency response agencies to achieve zero transportation deaths and injuries.
- **Proven Countermeasures** – Proactively implement proven transportation safety policies, processes, programs and initiatives.

Strategy 2: **Ohio will proactively address transportation safety, security and environmental risks.**

- **Risk** – Identify and mitigate transportation facilities at risk from extreme weather events.
- **Security** – Identify and mitigate transportation security risks, including cybersecurity risks.

In 2018, more than 36,000 people died while traveling on U.S. roadways, with over 1,000 of these traffic fatalities occurring in Ohio.

» A ***SAFE*** TRANSPORTATION SYSTEM

Strategy 1: **Ohio will champion initiatives leading to zero transportation deaths and injuries.**

While no traffic-related death is acceptable, Ohio has significantly reduced severe crashes since the 1980s thanks to safer vehicles, safer roads, faster emergency response, stronger laws and traffic enforcement that encourages seat belt use and discourages impaired driving.

However, emerging trends such as distracted driving, an aging population, increases in walking and biking, and the use of micromobility devices like electric scooters all pose new safety challenges.

While the majority of transportation fatalities and serious injuries occur on roadways, for the state to continue toward its goal of zero transportation deaths and injuries, continuous innovation and collaboration will be needed for all modes. Ohio will strengthen partnerships with public and private agencies to address safety across the transportation system and champion proven approaches, policies and initiatives.

#BIKING ***#WALKING*** ***#TRANSIT*** ***#MULTIMODAL*** ***#PARTNERSHIP***

Initiatives

- **Laws** – Strengthen transportation safety laws to address distracted driving, seat belt use, work zone speed limits and child passenger safety.

  Primary safety laws are proven to save lives. The state will continue to ensure the public's understanding of major safety issues and will build strong, broad-based coalitions to support passage of proven laws.

- **Partners** – Enhance collaboration among state and local safety, education, health, enforcement, engineering and emergency response agencies to achieve zero transportation deaths and injuries.

  Ohio will increase and expand collaboration among stakeholders and encourage frequent communication to break down institutional barriers and implement proven strategies.

- **Proven Countermeasures** – Proactively implement proven transportation safety policies, processes, programs and initiatives.

  Wherever possible, Ohio will accelerate statewide implementation of proven safety infrastructure and behavioral countermeasures.

Nearly 50% of all disasters declared by the federal government, since the state began keeping records in 1956, have occurred in the past two decades.

» A ***SAFE*** TRANSPORTATION SYSTEM

Strategy 2: **Ohio will proactively address transportation safety, security and environmental risks.**

Intense weather, such as high winds, temperature extremes and widespread flooding, is becoming more frequent, less predictable and longer lasting each year. Rising and lowering lake levels impact shipping and port operations on Ohio's maritime system, specifically on Lake Erie and the Ohio River. Cybersecurity risks present major challenges to the transportation system and its customers as technological improvements in connectivity, efficiency and safety continue to advance. Other safety and security concerns including human trafficking and the opioid crisis have worsened and require more attention and resources. COVID-19 has demonstrated the consequences of a rapidly spreading global pandemic.

As a result, managing today's transportation infrastructure and addressing future challenges require planning for uncertainty and risk. The state will continue to coordinate through state task forces and partner with law enforcement to strengthen monitoring and preparedness plans. ODOT and its partners will continue to build awareness of extreme weather, public health emergencies, cybersecurity risks and other safety and security concerns, while identifying investment strategies that proactively reduce severe impacts and disruptions to the transportation system.

#RESILIENCY ***#MARITIME*** ***#FUNDING***
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Initiatives

- **Risk** – Identify and mitigate transportation facilities at risk from extreme weather events.

  Information mapping and traffic monitoring systems data will continue to be used to identify risks, prepare emergency responses for unplanned events and incorporate activities that reduce risks to the state's assets. Ohio will seek to integrate real-time data by establishing a transportation data management framework to enable proactive traffic management, deploy enhanced weather applications, enable real-time signal priority, broadcast reliable traveler information, enhance fleet management applications and develop safety advisory systems.

- **Security** – Identify and mitigate transportation security risks, including cybersecurity risks.

  Agency and private sector processes will work to ensure that high-quality information, efficient data-processing and secure data sharing procedures exist across Ohio's transportation network and enhance system security to prevent hacking and data tampering.

» *SMART*

A *smart* transportation system focuses on using technology and innovation to enhance safety, reliability, mobility and other goals. This includes leveraging technologies and data to make more effective decisions about managing existing assets and operating all elements of the system. The emphasis on smart strategies reflects the rapid evolution and potential transformational impacts of technology and data. These strategies also apply across the full range of futures.

Strategy 3: **Ohio will leverage technology and data to improve transportation safety, efficiency and reliability.**

- **Asset Management** – Maintain transportation assets (including enabling technologies) in a "state of good repair."
- **Operations** – Employ Transportation System Management and Operations (TSMO) strategies to address congestion and improve reliability.

Strategy 4: **Ohio will evolve its transportation system for a connected and autonomous future.**

- **Infrastructure** – Empower partners to test and deploy advanced vehicle technologies through supporting infrastructure improvements.
- **Alternative Fuels** – Accommodate adoption of alternative fuel vehicles.
- **Broadband** – Make highway right-of-way assets available to help close broadband and cellular infrastructure gaps.

Technology solutions that address congestion and improve safety typically generate an excellent return on investment.

» A ***SMART*** TRANSPORTATION SYSTEM

Strategy 3: **Ohio will leverage technology and data to improve transportation safety, efficiency and reliability.**

Advances in infrastructure and vehicle technologies allow transportation agencies to do more with their existing transportation networks. In addition to established system management tools, such as real-time video monitoring and dynamic message signs, ODOT and partners are researching and implementing new solutions such as variable speed limits, wrong way vehicle detection and SmartLanes ("hard shoulder running") that will improve overall system safety, efficiency and reliability.

These types of projects are made possible through the explosion of available data that enables agencies to better track system performance in real time. ODOT and its partners have recognized the need to harness new data streams coming from connected vehicles, connected smart infrastructure and mobile devices to make better decisions more quickly and proactively manage Ohio's transportation system in real time.

As tools and data streams mature, Ohio will be well positioned to get the most out of its roads, transit systems, trails, rails, waterways and airspace. The state will continue to explore new technology solutions, develop stronger partnerships in roadway management and emphasize operational improvements to the existing multimodal system, to create a safer and more reliable travel experience.

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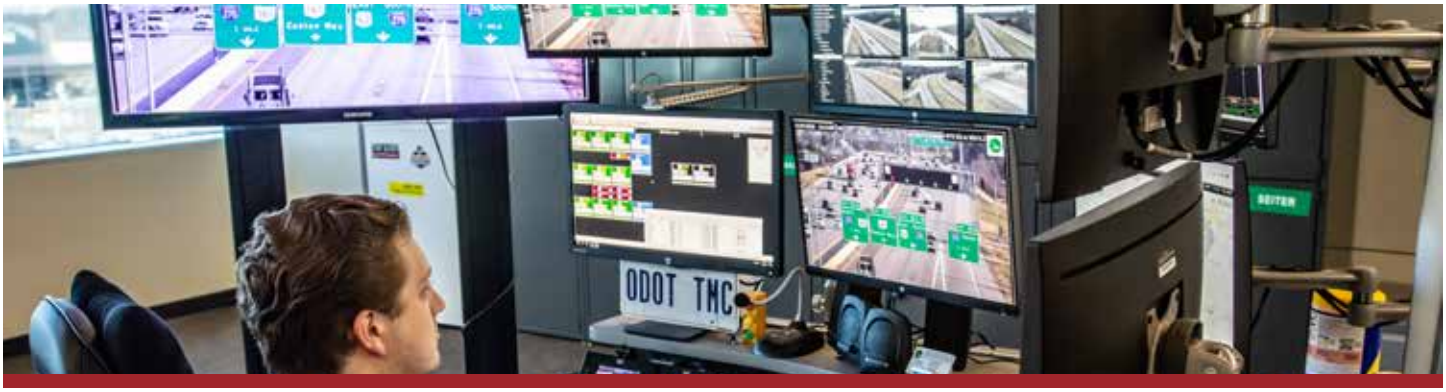

Initiatives

- **Asset Management** – Maintain transportation assets (including enabling technologies) in a "state of good repair."

  ODOT spends 93% of its annual budget taking care of what it already has. To get the greatest benefits of new and existing technologies, Ohio's transportation assets must be easily identifiable, cared for and put to their best use. This requires a commitment to using state-of-the-art technology for easy and quick decision making, preservation of current assets and robust collaboration. The state will ensure excellence in the quality of its assets and ensure a transportation system that is continuously in a state of good repair.

- **Operations** – Employ Transportation System Management and Operations (TSMO) strategies to address congestion and improve reliability.

  Operational strategies help Ohio get more out of the system that is already in place and prepare for the future. These include innovative intersection designs, variable speed limits and other active system management approaches that improve reliability across all modes. Moving forward, ODOT will continue to partner with agencies across Ohio to pursue TSMO strategies and implement the TSMO Plan.

ODOT and DriveOhio, a statewide center for advancing smart mobility, have been making technology projects a focal point. Since 2011, Ohio's public and private sectors have invested more than $500 million to develop and test advanced vehicle technologies.

» A ***SMART*** TRANSPORTATION SYSTEM

Strategy 4: **Ohio will evolve its transportation system for a connected and autonomous future.**

Over the next several decades, vehicles will become increasingly more autonomous and connected. The emergence of vehicles designed to perform driving functions and monitor roadway conditions will fundamentally change the way Ohio's residents, businesses and visitors interact with Ohio's transportation system.

Advanced vehicle technology could provide opportunities to improve the economic vitality and global competitiveness of Ohio, while making travel safer, more reliable and more convenient for everyone. However, to harness the potential benefits of a more autonomous and connected future, Ohio must remain proactive in its approach to evolving its transportation system to meet the demands of tomorrow.

Building on the work done by ODOT's DriveOhio and many other partners, the state will continue to develop the infrastructure necessary to support advanced vehicle technologies, continue to expand access to alternative fuels and support the expansion of broadband connectivity throughout the state.

#RESILIENCY ***#TRANSIT*** ***#EQUITY*** ***#TECH*** ***#PARTNERSHIP*** ***#ECONOMY***

Initiatives

» **Infrastructure** – Empower partners to test and deploy advanced vehicle technologies through supporting infrastructure improvements.

Ohio's transportation system must evolve to work with new vehicles. ODOT and its partners will assess and invest in the infrastructure needs of new vehicles. These needs can range from the most basic level, such as clear pavement markings, to the advanced, including roadside communication units that support the testing and deployment of vehicle technologies.

» **Alternative Fuels** – Accommodate adoption of alternative fuel vehicles.

Auto manufacturers are increasingly committing to the electric vehicle market. Electric and hybrid cars, trucks and buses can contribute to cleaner air, reduce greenhouse emissions and help achieve Ohio's sustainability goals. ODOT and its partners will encourage adoption of alternative fuel vehicles through investment in fleets of electric, compressed natural gas and hydrogen fuel cell transit buses and facilitation of electric charging stations for personal vehicles.

» **Broadband** – Make highway right-of-way assets available to help close broadband and cellular infrastructure gaps.

Rural areas of Ohio, in particular, need better broadband connectivity to reap the benefits of newer technologies. Improved digital communications infrastructure will help close these gaps and improve access for all. The state will assist by making right-of-way assets available to partners.

» CONNECTED

A *connected* transportation system focuses on integrating all modes of transportation to support complete end-to-end trips and provide more options for Ohio's residents, visitors and businesses. These strategies include a focus on the major corridors that link Ohio's regions and communities together and support high-capacity flows of people and freight. A connected system with choices can adapt to the full range of futures.

Strategy 5: **Ohio will enhance critical elements of its transportation system to optimize safe, efficient and reliable movement of people and goods.**

- **Passenger Modes** – Advance investments in Ohio's walking, biking and transit networks.
- **Freight Modes** – Continue investments in ODOT roadways, railroads, maritime and airports.

Strategy 6: **Ohio will develop transportation plans for major statewide and regional transportation corridors.**

- **Corridor Plans** – Develop multimodal corridor plans that engage a comprehensive set of stakeholders and consider transportation, land use, economic and technology assets.

Over one billion tons of goods valued at nearly two trillion dollars move through Ohio's roads, rail, waterways and airports each year.

» A ***CONNECTED*** TRANSPORTATION SYSTEM

Strategy 5: **Ohio will enhance critical elements of its transportation system to optimize safe, efficient and reliable movement of people and goods.**

It is critical to the overall economic and social well-being of Ohio to have the presence of well-connected and developed multimodal networks at the local, regional and state levels. Whether trips are being made by people or goods, the ability to seamlessly transfer between modes, facilities and operators eases congestion along our roadways, increases access to regional jobs and services, and ensures that safety, efficiency and reliability are hallmarks of every trip.

Because Ohio's transportation infrastructure is owned and operated by a variety of public and private entities, enhancing connectivity across the system can be a challenge. Reaching consensus on how best to coordinate investments, connect networks and gain operational efficiencies requires extensive coordination among partners. An integrated multimodal system relies on sustained engagement throughout the planning, design, construction and operation of transportation facilities.

ODOT and its partners will work to strengthen collaboration and ensure individual investments in our shared transportation system are advancing connected multimodal transportation networks at the local, regional and state levels.

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Initiatives

- **Passenger Modes** – Advance investments in Ohio's walking, biking, roadway and transit networks.

  ODOT will coordinate with its transportation partners to seamlessly connect state investments with local infrastructure and make passenger travel safer and easier for people going across town and/or across the state.

- **Freight Modes** – Advance investments in Ohio's roadways, railroads, maritime and airports.

  ODOT will coordinate with private and public providers of freight transportation to efficiently move and transfer goods across modes. ODOT will support targeted improvements at strategic locations to enable the growth of Ohio's economy.

» A ***CONNECTED*** TRANSPORTATION SYSTEM

Strategy 6: **Ohio will develop transportation plans for major statewide and regional transportation corridors.**

ODOT is working with local partners to develop long-range corridor plans that apply the AO45 alternative futures to understand evolving mobility needs of strategic corridors across Ohio.

Multiple statewide and regional transportation corridors combine to form the backbone of Ohio's transportation system, moving vast amounts of people and goods within regions and across the state every day. It's important that the infrastructure within these corridors operate efficiently and evolve to mitigate operational issues such as crashes or congestion. Operational issues have a ripple effect across the network that disrupts other modes, such as transit and intermodal freight movement, and stifles industry, tourism and local economic needs.

Large scale, long-term multimodal corridor planning is a proactive and collaborative process for advancing the strategic evolution of Ohio's critical assets. It provides a wide array of stakeholders and partners the opportunity to collaboratively make decisions about future transportation and other infrastructure investments. Strategic corridor level planning ensures consideration of state and local development goals, and ensures environmental stewardship.

ODOT and its partners will engage in continuous and cooperative planning around the strategic development of major statewide and regional transportation corridors. This work will help identify and advance necessary investments, relationships and changes that will position Ohio to proactively address challenges and opportunities along its most critical systems.

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Initiative

» **Corridor Plans** – Develop multimodal corridor plans that engage a comprehensive set of stakeholders and consider transportation, land use, economic and technology assets.

ODOT will collaborate with MPOs, RTPOs and local governments to develop and implement corridor planning studies along the significant statewide and regional corridors that make up the state's strategic transportation system.

In 2019 ODOT launched a study of the US 33 corridor from Bellefontaine to Dublin, Ohio. The study team includes representatives from counties (Logan and Union), cities (Bellefontaine, Marysville and Dublin) and regional transportation planning organizations (LUC and CORPO). The purpose of the study is to develop a shared vision to proactively address future needs along the corridor. The US 33 corridor plan will serve as a prototype for plans on other critical corridors in Ohio.

» COMMUNITY-ORIENTED

A *community-oriented* transportation system focuses on supporting community visions and addressing issues such as equity and public health. It balances statewide mobility and connectivity needs with community-specific goals. These strategies adapt to the unique mobility opportunities and challenges each Ohio community may face in the future.

Strategy 7: **Ohio will advance transportation investments that expand the state's economy and workforce.**

- **Job Access** – Continue to prioritize transportation system investments that grow the economy and improve access to jobs.
- **Economic Development** – Identify and promote locations for economic development with good transportation access and compatible land uses.

Strategy 8: **Ohio will advance a transportation system that improves quality of life and moves communities forward for all residents.**

- **Values, Health, Equity** – Support multimodal transportation investments that align with community values, public health and equity.

- **Older Adults, People with Disabilities** – Promote accessibility and mobility for an aging population and persons with disabilities.
- **Environment** – Continue to avoid, minimize and mitigate environmental impacts within transportation investments.

Strategy 9: **Ohio will increase access to transit and shared mobility services.**

- **Local Transit** – Increase opportunities for local investments in transit through ODOT's funding programs.
- **Coordinated Services** – Integrate inter-regional and local transit with human service transportation services.
- **Mobility as a Service** – Advance Mobility as a Service (MaaS), including first and last-mile connections.

Strategy 10: **Ohio will advance walking and bicycling as a safe, convenient and accessible transportation option for everyone.**

- **Planning & Policy** – Strengthen statewide, regional, local and corridor pedestrian and bicycle planning.
- **Education & Promotion** – Educate and inform roadway users, elected officials and practitioners on walking and biking issues.
- **Collaboration** – Promote partnerships and programs to engage state, regional and local practitioners and advocates.

Ohio's skilled workforce of 5.7 million people is known for its productivity and strong work ethic. Workers need reliable, safe access to jobs; businesses need efficient freight infrastructure to ship their products; and more travel options provide people access to job training, education centers and other services.

Strategy 7: **Ohio will advance transportation investments that expand the state's economy and workforce.**

Communities across Ohio have always relied on transportation to support their regional and local economies. Workers need reliable, safe access to jobs; businesses need efficient freight infrastructure to ship their products; and more travel options provide people access to job training, education centers and other services. Ohio will see changes to historic shipping and distribution patterns as emerging technologies, such as 3D printing and automated warehousing, speed up production, and manufacturing becomes specialized and located closer to consumers. These changes will increase pressure on transportation reliability and require efficient, multimodal access to a wider range of jobs.

To evolve and keep pace with the opportunities of tomorrow and ensure the state's economy and workforce continue to thrive, ODOT and its partners must ensure transportation improvements address economic opportunity gaps. Businesses located near existing transportation facilities (airports, rail terminals, highways and water ports) can efficiently move their products to local and global markets. At the same time, businesses well-served by roads, transit service and bicycle/pedestrian access can retain and attract more employees and customers.

#TRANSIT #EQUITY #FUNDING #TECH
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#SAFETY #EFFICIENCY #ECONOMY #CONGESTION

Initiatives

» **Job Access** – Continue to prioritize transportation system investments that grow the economy and improve access to jobs.

ODOT will continue to emphasize economic development impact in its project prioritization and selection process to ensure major interchanges, intermodal facilities, transit-oriented development, critical multimodal connections to job centers, distribution hubs and ports are prioritized and advanced.

» **Economic Development** – Identify and promote locations for economic development with good transportation access and compatible land uses.

ODOT will continue to coordinate with state agencies, local governments and economic development officials to highlight sites that have existing roadway, transit, bicycle and pedestrian access. ODOT will provide responsive transportation solutions that position Ohio to remain economically competitive and attract businesses and jobs of the future.

Small changes in the health of Ohioans, such as increased access to active transportation, could contribute to preventing more than 600,000 new cases of cancer, diabetes, heart disease and stroke.

Strategy 8: **Ohio will advance a transportation system that improves quality of life and moves communities forward for all residents.**

The population of Ohio is getting older and becoming more diverse. By 2045, 20% of the population will be over 65 and nearly 30% will be non-white. At the same, 15% of Ohioans today have a physical condition that impairs their mobility and access to transportation. Many individuals with disabilities also live in areas with higher rates of poverty. Ohio's poverty rate is slightly higher than the national average and income disparity could grow in the future. These trends highlight the importance of equity and transportation access considerations regardless of age, income or race.

As Ohio's long-range transportation plan, AO45 considers equity, public health and other community values to prevent disproportionate impacts to underserved populations. It also highlights stewardship opportunities that balance present-day social, environmental and economic concerns with the needs of future generations. This is a shift for Ohio's transportation agencies requiring a greater focus on moving people, not just vehicles, to support affordable, accessible and sustainable transportation options to access jobs, health care and other services.

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Source: This Week Community News

Initiatives

» **Values, Health, Equity** – Support multimodal transportation investments that align with community values, public health and equity.

ODOT and local partners will advance strategic and timely transportation infrastructure such as sidewalks, curb ramps, trail access and seamless multimodal connections that provide healthier, more equitable and active ways to travel to, from and within Ohio's communities.

» **Older Adults, People with Disabilities** – Promote accessibility and mobility for an aging population and persons with disabilities.

ODOT will work through local partnerships to facilitate the growth of on-demand services, shared mobility and automated and connected technology to meet the transportation needs of older adults and persons with disabilities.

» **Environment** – Continue to avoid, minimize and mitigate environmental impacts within transportation investments.

ODOT will continue to assess impacts to environmental assets early in the planning process and evolve its work to prevent and mitigate impacts as new types of data become available.

Central Ohio Transit Authority (COTA)'s new COTA//Plus service is piloting an on demand, app based ride-hailing service that can book multiple passengers heading in the same direction into a shared vehicle. This style of service is highly flexible – facilitating point-to-point ride-hailing or making connections through traditional bus lines and stops.

Strategy 9: **Ohio will increase access to transit and shared mobility services.**

Transit needs across Ohio are evolving and growing as personal transportation costs, customer preferences and demographics are shifting. At the same time, new mobility options such as bus rapid transit and autonomous, on demand shuttles are emerging. More integrated, scheduled service models tailored to customer needs and facilitated by mobile applications are being implemented in Ohio and across the country. Mobility as a service (MaaS) is providing on-demand, flexible options, often using smaller vehicles, to make first and last-mile transit connections in densely populated and rural areas. Local transit operators will increasingly need to adapt to changing technologies and customer demands by prioritizing convenient, end-to-end travel that crosses jurisdictional boundaries and maintains passenger health and safety.

As these services and systems continue to evolve, the state recognizes the need to enhance transit systems' management and efficiency. Working closely with local partners, ODOT will seek to expand opportunities for local transit investments through its funding programs, ensure regional and human service transit operations are well planned and coordinated, and explore opportunities to advance mobility services to address first and last-mile challenges.

#RESILIENCY #BIKING #WALKING #TRANSIT #EQUITY #MULTIMODAL #FUNDING #TECH #PARTNERSHIP #SAFETY #EFFICIENCY #ECONOMY #CONGESTION

Initiatives

- **Local Transit** – Increase opportunities for local investments in transit through ODOT's funding programs.

  ODOT will expand eligibility requirements within its funding programs to integrate and include a broader set of transit considerations within infrastructure investments such as transit stop improvements, transit-only lanes and shoulders, transit signal prioritization, active transportation and active transportation access to transit stops.

- **Coordinated Services** – Integrate inter-regional and local transit, with human service transportation services.

  ODOT will work closely with the Ohio Public Transit Association, intercity transit providers, and local operators to support coordinated plans and services that result in streamlined operations, decreased costs and enhanced customer experiences.

- **Mobility as a Service** – Advance Mobility as a Service (MaaS), including first and last-mile connections.

  Emerging technologies will provide convenient, on-demand transportation to meet a variety of mobility needs. ODOT will expand and enable technical resources to broaden MaaS options that enhance access to transit stations and multimodal hubs, educational institutions, job centers and medical services.

Walk.Bike.Ohio is intended to reduce bike and pedestrian fatalities and serious injuries and ensure Ohio's transportation system accommodates all ages, abilities and incomes.

Strategy 10: **Ohio will advance walking and bicycling as a safe, convenient and accessible transportation option for everyone.**

Walking and bicycling are essential transportation options in many of Ohio's communities. Where socio-economic barriers exist to accessing automobile-based transportation, many Ohioans rely on these affordable modes to get to work, buy healthy food, visit a doctor, go to school or connect with their neighbors, friends and family. Combined with shifting demographics, transportation preferences and technology, the need for well-connected and safe pedestrian and bicycle networks is only increasing.

Local partners and ODOT are responding by investing in active transportation infrastructure that helps bridge gaps between and within communities, improve safety, provide access to key destinations and support economic development. As this important work continues, Ohio must remain coordinated in its approach to advancing walking and biking as a safe, convenient and accessible transportation option for everyone.

Guided by Walk.Bike.Ohio, state, regional and local partners will work to advance planning and policies related to walking and bicycling and increase opportunities for investments in regional and local non-motorized networks. Partners will work toward collaborating strongly around the state, sharing resources and data, and implementing educational and promotional campaigns around road safety, tourism and active transportation.

#BIKING #WALKING #EQUITY #MULTIMODAL #FUNDING #PARTNERSHIP #SAFETY #EFFICIENCY #ECONOMY #CONGESTION

Initiatives

- **Planning & Policy** – Strengthen statewide, regional, local and corridor pedestrian and bicycle planning.

  ODOT will develop strategic, statewide active transportation infrastructure policies, resources, technical assistance and programs that address walking and bicycling needs and encourage alignment in state, regional and local planning. This includes working with partners to continue to develop and maintain connected pedestrian and bicycle networks, and designate and strengthen Ohio's State and US Bike Route system.

- **Education & Promotion** – Educate and inform roadway users, elected officials and practitioners on walking and biking issues.

  In coordination with state agencies and local partners, ODOT will help develop educational resources and promotional campaigns focused on walking and biking transportation.

- **Collaboration** – Promote partnerships and programs to engage state, regional and local practitioners and advocates.

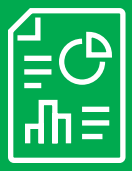
  ODOT will work to continuously engage stakeholders and organizations on the opportunities and challenges surrounding walking and bicycling and accomplish mutual goals.

» COLLABORATIVE

A *collaborative* transportation system focuses on how all of Ohio's transportation partners can work together to advance statewide and community goals, including leveraging data and financial resources. These strategies are foundational to plan implementation across all futures.

Strategy 11: **Ohio will strengthen its transportation partnerships.**

» **Partnerships** – Continue to strengthen partnerships with other organizations at the state, regional and local levels.



Strategy 12: **Ohio will expand the transparent use and sharing of transportation data and information.**

- **Data Sharing** – Establish protocols to seamlessly and securely share transportation data among partners.

Strategy 13: **Ohio will advance innovative and sustainable transportation funding options.**

- **Highway Funding** – Investigate and pursue long-term sustainable funding strategies to reduce reliance on motor vehicle user fees, such as vehicle miles traveled (VMT) fees.
- **Transit Funding** – Investigate and pursue long-term sustainable transit funding strategies that adapt to changing user needs and conditions.
- **Public-Private Partnerships** – Pursue public-private partnerships to jointly finance priority transportation projects.

Ohio has 17 metropolitan areas with a population of 50,000 or greater. Each area has an MPO that conducts transportation planning. Over 85% of Ohioans live in areas covered by MPOs. Six RTPOs coordinate transportation planning in non-metropolitan areas of Ohio covering 41 counties.

» A ***COLLABORATIVE*** TRANSPORTATION SYSTEM

Strategy 11: **Ohio will strengthen its transportation partnerships.**

More than 2,500 agencies collectively own, operate, plan and manage Ohio's transportation system. This includes ODOT, 17 MPOs, six RTPOs, 88 counties, 251 cities, 681 villages, 1,308 townships, 61 transit systems, 104 public airports, 38 railroads and eight ports. In addition, there are many more private and public partners that directly contribute to the success of Ohio's transportation system every day. As Ohio's transportation agencies collectively work to address emerging issues and opportunities, the number and range of partners continues to steadily grow. The ability of this growing network to come together and effectively collaborate is critical to the successful implementation of AO45 strategies.

Enhancing safety requires a broad partnership of transportation, law enforcement, education and emergency response partners. Advancing smart solutions engages technology firms, research entities, data providers, communications providers and the insurance industry. A connected system requires collaboration across modes and jurisdictions, including with other states. And a community-oriented system requires collaboration between transportation and organizations involved in economic and workforce development, public health, housing, aging, disabilities, historic and cultural resources, and others.

ODOT has a long history of working with other state agencies, MPOs, RTPOs, modal partners and other partners on long-term planning issues and specific programs and policies. Ohio's regions and communities also offer many examples of effective partnerships. AO45's implementation will build upon this foundation and emphasize continued collaboration at the state, regional and local levels. This will include strengthening the steering committee that guided development of AO45's vision, goals and strategies.

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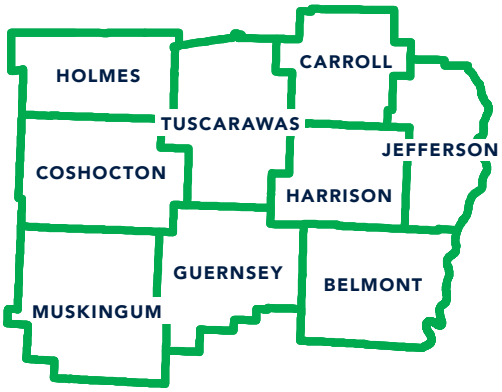
Initiative

» **Partnerships** – Continue to strengthen partnerships with other organizations at the state, regional and local levels.

ODOT will take a lead role in facilitating a broad-based steering committee that will provide transportation partners a forum and structure to advance the full spectrum of AO45's strategies, and continuously collaborate on the state's long-range transportation planning efforts. ODOT also will continue close coordination with other state agencies and with Ohio's MPOs, RTPOs and local governments.

In 2012, ODOT initiated a closer relationship with Ohio's RTPOs. The new partnership includes funding for transportation planning activities, collaboration among ODOT and RTPO staffs, and sharing resources and tools. The partnership has led to innovative planning projects, such as the Regional Human Services Coordinated Plan Pilot led by the Ohio Mid-Eastern Governments Association (OMEGA). The project has developed a coordinated regional plan for ODOT, incorporating nine rural counties.



Ninety percent of all data that now exists in the world was generated in just the last two years.

» A ***COLLABORATIVE*** TRANSPORTATION SYSTEM

Strategy 12: **Ohio will expand the transparent use and sharing of transportation data and information.**

Data is as significant to the 21st century transportation system as asphalt and concrete were to the prior century. The heightened emphasis on performance and asset management, system operations and management, travel options (such as active transportation) and customer service is increasing the need for ODOT and other transportation partners to access reliable transportation data. At the same time, emerging information and communications technologies are combining with expanding connectivity and computing power to exponentially grow the amount and quality of data available.

The ability to collect, analyze, share and report transportation data and information is a foundation for implementing all AO45 strategies. High quality data can help identify and mitigate safety and security risks. Data also can enable real time management and operation of all modes on Ohio's transportation system, facilitate seamless end-to-end mobility across modes and jurisdictions, and align transportation plans and investments to support community needs.

ODOT has received national recognition for its commitment to transportation data management, governance and analysis. This foundation must continue to expand to additional types of data as well as to other transportation partners. Agencies must continue to invest in data collection, analysis, visualization and reporting tools, as well as in efforts to ensure data integrity, quality and privacy. In addition, ODOT must work to ensure access to consistent statewide asset data on bridge, pavement and sidewalk conditions; and ensure availability of more precise data on growing trends like shared mobility and e-commerce.

#BIKING ***#WALKING*** ***#TRANSIT***
#MULTIMODAL ***#TECH*** ***#PARTNERSHIP***
#EFFICIENCY ***#ECONOMY*** ***#CONGESTION***

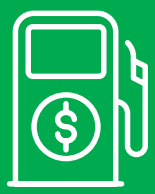
Initiative

» **Data Sharing** – Establish protocols to seamlessly and securely share transportation data among partners.

Ohio will build on existing ODOT and partner policies, data governance plans and tools to expand the ability to share transportation data across a wide range of partners.

ODOT recently completed its first SmartLane project on I-670 in Columbus. A SmartLane is used as a travel lane during peak hours, but becomes a shoulder during other times of the day. Successful operation of the I-670 SmartLane requires analysis of numerous live data streams. ODOT then publishes the current speed limit and live camera feeds via its OHGO app and website.

As Ohio's transportation system evolves, so too will the mix of investments required to achieve the state's transportation vision.



» A ***COLLABORATIVE*** TRANSPORTATION SYSTEM

Strategy 13: **Ohio will advance innovative and sustainable transportation funding options.**

Meeting the mobility needs of Ohio's residents, visitors and businesses will require billions of dollars of investment over the next 25 years. Several trends will make addressing these needs increasingly challenging.

The outlook for federal funding, which accounts for about 40% of ODOT's highway funding, is unclear due to the constrained federal budget and an uncertain future for the Federal Highway Trust Fund. Motor vehicle user fees from fuel account for a large share of state revenue for ODOT and the federal funding that flows through ODOT. The value of these fees is being eroded by increasing vehicle fuel efficiency and the growing number of electric and other alternative fuel sources and could be further eroded by a shift toward using transit, bicycling, walking or simply working from home.

Additionally, Ohio's Constitution restricts the use of vehicle-related fuel revenues to statutory highway purposes. Non-highway modes including rail, aviation, bicycling and walking are generally supported through state general fund allocations and other public and private revenue sources. Local governments, private railroads and public transportation authorities are primarily responsible for funding the rest of the state's transportation system today. Many of these partners face their own financial challenges and uncertain funding outlooks.

As Ohio's transportation system evolves, so too will the mix of investments required to achieve the state's transportation vision. Emerging technologies and data sources, combined with changing customer expectations, may provide greater opportunities for innovative approaches to transportation revenue. ODOT will work with its partners to explore new funding approaches with emphasis on highways, transit and active transportation including the role of public-private partnerships.

#BIKING ***#WALKING*** ***#TRANSIT*** ***#MULTIMODAL*** ***#FUNDING*** ***#TECH*** ***#PARTNERSHIP***

Initiatives

» **Highway Funding** – Investigate and pursue long-term sustainable funding strategies to reduce reliance on motor vehicle user fees, such as vehicle miles traveled (VMT) fees.

Ohio will research, pilot and implement options for providing sustainable highway funding, including options such as tolling, VMT fees and other road user charges. ODOT will work with its partners to explore these funding alternatives to identify approaches for reducing long-term dependence on the motor vehicle user fee.

» **Transit Funding** – Investigate and pursue long-term sustainable transit funding strategies that adapt to changing user needs and conditions.

Ohio also will research, pilot and implement innovative approaches to funding transit capital and operating costs, as well as other multimodal and shared mobility solutions. ODOT will work with other partners to explore potential transit funding solutions, recognizing existing constitutional and legal constraints.

» **Public-Private Partnerships** – Pursue public-private partnerships to jointly finance priority transportation projects.

Ohio will expand the use of public-private partnerships to finance major projects, emphasizing opportunities to accelerate needed improvements while protecting the public interest. ODOT will work with partners to advance policies and initiatives that support effective public-private partnerships.

Implementation

The success of any planning process lies in tangible results and progress towards stated goals and objectives. Therefore, the completion and publication of a new transportation plan does not mark the end of ODOT's work, but rather just the beginning. Comprehensive implementation of AO45 strategies and initiatives will move Ohio toward the plan's vision to move people and freight efficiently and reliably.

Key Elements of ODOT's Approach to AO45 Implementation Over the Next Five Years

- **Retain an Advisory Committee.** For the first time ODOT will use a broad-based advisory committee of key partners and stakeholders to advance plan implementation. This statewide committee will identify implementation priorities and coordinate ongoing actions to ensure AO45 remains a living document.

- **Develop implementation plans for priority initiatives.** An initial activity for ODOT and the Advisory Committee will be to develop implementation plans for priority initiatives. While all strategies initiatives are important, certain initiatives may lead to quicker short-term progress and set the stage for longer-term activities.

- **Use AO45's vision and goals to guide and inform ODOT and partner plan updates.** ODOT will develop guidance for how AO45 can provide a framework for other ODOT, MPO and RTPO plans, including how the Advisory Committee can assist with coordination across plans.

- **Monitor and track progress toward AO45's goals.** ODOT and the Advisory Committee have begun to identify potential progress indicators for each goal. These indicators build upon ODOT's Critical Success Factors and transportation performance measures mandated by the federal government. Examples include measures of fatalities and serious injuries, bridge and pavement conditions, travel time reliability and air quality. Additional indicators may include data collected by partners who own and operate modal systems, such as the condition of infrastructure and vehicles. Other progress indicators could include newer concepts developed to support AO45 implementation.

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